# Insights on the acting role of Martian atmosphere in the fragmentation pathways of organic and C-containing inorganic compounds using LIBS

T. Delgado, L.M. Cabalín, R. Mora, L. García and J. J. Laserna

Departamento de Química Analítica, Universidad de Málaga, Facultad de Ciencias, Campus de Teatinos s/n, 29071 Málaga, España

*tomas.delgado@uma.es

In the present work, a preliminary fundamental study about the influence of background gas in Martian surface conditions ($CO_2$, P=7 mbar) on the formation of emitting species in laser-induced plasmas of ablated C-containing compounds was performed. Results were compared with those obtained using ambient air as surrounding gas of irradiated samples.

Energy thresholds were evaluated for excited atomic and molecular species of interest resulting in the plasma using a home-made LIBS system coupled to a pressure chamber for simulating Martian environment during the analysis of samples. Inorganic salts as calcium carbonate and magnesium carbonate besides pyrene as organic reference compound were analyzed in order to discern the origin of C-containing species coexisting in the plasma plume (C, $C_2$ and CN, mainly).

Results from acquired emission spectra shed light on the different carbon sources of emitting species as a function of energetic and pressure conditions.